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The 2003 Iowa Corn Yield Test Report, District 4

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The 2003 Iowa Corn Yield Test Report, District 4

Abstract

Results of the Iowa Crop Performance Test-Corn are published to aid Iowa farmers in selecting corn hybrids. This is the 84th consecutive year for the test. These data are first released on the Iowa Crop Improvement Association's homepage at <http://www.agron.iastate.edu/icia/> usually around the end of November.

Disciplines

Agriculture

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Visit the Iowa Crop Improvement Association online at <http://www.agron.iastate.edu/icia/>

A supplement to the December 13, 2003, issue of *Iowa Farmer Today*



2003 Iowa Crop Performance Test—Corn District 4

Results of the Iowa Crop Performance Test—Corn are published to aid Iowa farmers in selecting corn hybrids. This is the 84th consecutive year for the test.

These data are first released on the Iowa Crop Improvement Association's homepage at <http://www.agron.iastate.edu/icia/> usually around the end of November.

The next released format of these data is in the Iowa Crop Management Database program. A description of this program and an order form can be found at <http://extension.agron.iastate.edu/CMD/>. A short description of how this program manages these data is provided in the "Other Reports" section of this report.

In 2002, DTN (Data Transmission Network) began including a summarized version of these data on their system.

The final format is the printed version, which is printed and distributed by *Iowa Farmer Today* in its Dec. 13, 2003 issue. A few days later, the printed reports also are available from county extension offices.

The presentation of data for the hybrids tested does not imply approval or endorsement by the authors or the agencies sponsoring or conducting the test. Entries in Tables 1, 1A, and 2 are designated by brand name and variety.

Use of These Data in Advertisements

Iowa State University and the Iowa Crop Improvement Association desire to maintain the credibility of data from the Iowa Crop Performance Test—Corn. Misuse of these data in advertisements can have a negative effect on the perception of the value of these data. For advertising purposes, brand-to-brand comparisons should not be made unless more than one competitor brand is used in the ad and all entries of competitor brands in a reported table are included in the ad. Advertisement statements by an individual company about the performance of its entries can be made as long as they are accurate statements about the data as published with no reference to other companies' hybrids. A statement similar to: "See the official *Iowa Crop Performance Test—Corn* report, PM 660 (1-7) 03, for details," should be included in the ad.

2003 Procedure

Producers of seed corn and Iowa State University were eligible to enter hybrids in the Iowa Crop Performance Test—Corn. Each producer was allowed a maximum of 12 paid entries per district. All commercial entries had to be available in a quantity of at least 10 bushels of seed.

In 2003, data are reported on 125 entries in this district. Nine of the entries determined to be check hybrids were entered by the Iowa Crop Improvement Association. In June, survey cards were mailed to a random sample of corn growers in Iowa. Based on the survey results, the 9 hybrids grown on the most acres in the district were classified as check hybrids for the district. The check hybrids (\$ and !) in this report were determined by the 2002 survey. The Iowa Crop Improvement Association entered a maximum of three check hybrids of any given brand. These entries were given priority over the remaining 116 entries made by seed producers.

Each entry was replicated four times in four-row plots at a planting rate of 29,000 kernels per acre at each location. All locations were machine planted. The center two rows of each plot were harvested with a corn combine. No gleanings or dropped ears were included in yield data. A moisture determination was made from each plot and yields were corrected to 15.5 percent moisture for shelled corn.

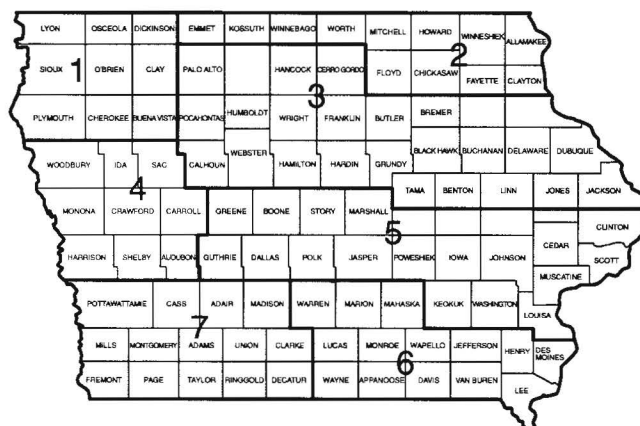
Since 1988, data for protein, oil, and starch percentages have been included in the *Iowa Crop Performance Test—Corn* reports. Protein, oil, and starch were measured on an Infratec 1225 near-infrared transmittance analyzer calibrated against accepted chemical methods as done by Woodson-Tenent Labs, Des Moines, Iowa. Dr. Charles R. Hurburgh, Jr. of the ISU Department of Agricultural and Biosystems Engineering was responsible for analyzing the samples.

Samples for nutrient analysis were collected from one field in each district. Data presented are averages of the four replicated plots in that field. To be consistent with the yield data, the protein, oil, and starch data were corrected to 15.5 percent moisture.



Iowa Crop
Improvement
Association

IOWA STATE UNIVERSITY
University Extension



PM 660 4 03 December 2003

How Information Is Presented

The agronomic data presented are averages of three locations in 2001, 2002, and 2003. Yield in bushels per acre and percentages of moisture, root lodging, stalk lodging, dropped ears, stand, protein, oil, and starch are shown for all entries in 2003 and for those tested in 2001 and 2002 that were in the 2003 test.

Interpretation of Results

Yield differences due to variation in soil, fertility, moisture availability, insect infestation, and diseases, plus any variation due to planting and harvesting techniques, are identified through statistical analysis. The LSD values for yield shown in Tables 1, 1A, and 2 represent, in bushels per acre, the amount of yield variation that could be due to variations in the factors just mentioned. In comparing varieties, yield differences greater than the LSD value can be attributed to genetic differences in the yield potential of these varieties; yield differences less than the LSD value are not statistically different and could have been due to other factors.

Grain moistures shown in Tables 1, 1A, and 2 are indications of maturity and natural drying rate. Maturity of varieties entered generally ranged from short to full season. Yield comparisons should be made among varieties of similar maturity.

It is important to select varieties having stable performance over a range of environmental conditions. High yields for two or more consecutive years, Table 2, indicate stable performance. Also, starting in 2002, to increase the range of environmental conditions reported on in one year, 18 additional tables are provided electronically on the Iowa Crop Improvement Web page that merge data across districts. These tables double, and in some cases even triple, the number of locations reported on for hybrids entered in several districts. Supplemental yield and agronomic information about specific varieties may be obtained from seed corn dealers, crop consultants, and from neighbors who have grown these varieties.

The protein, oil, and starch percentage data (Tables 1, 1A, and 2) are quality traits important to different end-users of corn. For feed, protein is of primary interest; for wet-mill processing (ethanol and sweeteners), oil and starch content are important. Several firms have begun testing these characteristics on a routine basis. There are now more than 50 Iowa grain elevators with this testing capability.

Whole-grain near-infrared equipment measures composition of unground corn kernels in 1 to 1.5 minutes per sample. The equipment measures moisture simultaneously with composition. Using these instruments, country elevators can test and segregate grain as it is received. Obviously, all compositional factors cannot be high in the same hybrid. The grain market is expanding the production and marketing of certain hybrids for specific uses. This is an important change from the generic commodity approach widely used now.

The economic impact of compositional factors can be significant. Corn protein trades off with other protein sources in many feed rations. At \$200 per ton for 44 percent protein soybean meal, the value of a 1 percent increase (e.g., from 8 percent to 9 percent) in corn protein is about 12 cents per bushel of corn. Likewise, an additional percent of oil yields about 10 to 14 cents per bushel in increased oil output in a wet processing plant or when substituted for white grease in feed rations. The additional ethanol or sweetener from an extra percent of starch provides 8 to 10 cents per bushel more revenue. Producers feeding livestock are in the best position to capture immediate benefits from these composition data. Country elevators with feed mills also have the ability to capitalize on increased protein in corn. The Iowa Corn Growers Association has prepared a publication to aid growers in using the nutrient data in the *Iowa Crop Performance Test—Corn* reports: *Nutrient Content and Feeding Value of Iowa Corn*, Iowa Corn Growers Association, Des Moines, Iowa 50265.

Hybrids with similar yields and agronomic characteristics may not be identical in corn composition. Therefore, feed costs can be reduced by selecting higher protein hybrids from a group with similar yield potential. Weather and soil conditions affect composition, but the relative ranking of hybrids does not change greatly. A higher protein hybrid will be higher than average regardless of environmental conditions that raise or lower the averages. The protein percentages reported are measures of crude protein and may not give an accurate indication of feed value if feed rations are balanced on individual amino acids rather than crude protein content.

2003 Field Data

The District 4 test was planted on farms operated by Maurice Wilt near Salix in Woodbury County, Rod Backhaus near Westside in Crawford County, and the

McIntosh brothers near Missouri Valley in Harrison County. Field data are presented in Table A.

Table A. Field Data

Fertilizer applied, lb.	Wilt Farm Salix silty clay			Backhaus Farm Marshall silty clay loam			McIntosh Farm* McPaul silt loam		
	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Preplant	—	—	—	21	54	102	165	—	—
Preemerg	120	—	—	30	—	—	—	—	—
Starter	3	6	3	—	—	—	—	—	—
Sidedress	—	—	—	133	—	—	—	—	—
Total	123	6	3	184	54	102	165	—	—
2002 crop	Soybeans			No Till Soybeans			Soybeans		
Row width	30 inches			30 inches			30 inches		
Planting date	May 22			April 29			April 22		
Harvest date	Oct. 21 & 22			Oct. 22 & 23			Sept. 26		
Average yield	150 bu/a			198 bu/a			196 bu/a		

*Field sampled for protein, oil, and starch percentage data.

Other Reports

Separate reports are available for each district shown in Figure 1. A limited supply of these publications is available at your county extension office or from Extension Distribution Center, 119 Printing and Publications Building, Iowa State University, Ames, Iowa 50011. Also, these data are available along with a hybrid selection program as a part of the Iowa Crop Management Database program. Along with all of the information as it appears in these written reports, the section of the Iowa Crop Management Database program that uses these data allows farmers to insert their own drying and shrink costs, expected price of corn, and final moisture percentage after drying. Using these specific criteria, the program calculates an adjusted economic value for each hybrid in the test. Farmers can then determine which hybrids might best fit their own production practices and provide the most profit. The computer program also can sort the hybrids by yield, moisture, adjusted value, root lodging, stalk lodging, dropped ears, protein, oil, starch, or brand and then print the data as sorted. It will also allow the user to tag selected hybrids and then list those selected hybrids as a new table for ease of viewing. A Pentium 1 computer or higher running Windows 95 or newer with a CD ROM drive and 30 megabytes of hard disk space are required to run the program. The cost of the program is a onetime purchase of \$100. Future years' data can be downloaded from the Web at no charge. If the user cannot access the Web to download the new data, the price will be \$25 for all seven districts' data. Order forms and a description of the program are available from Agribusiness Education Programs, telephone 515-294-6429 and on the Web at <http://extension.agron.iastate.edu/CMD/>.

The 2003 Iowa Crop Performance Test—Corn:

PM 660 1 03 District 1	PM 660 4 03 District 4	PM 660 6 03 District 6
PM 660 2 03 District 2	PM 660 5 03 District 5	PM 660 7 03 District 7
PM 660 3 03 District 3		

File: Agronomy 2-2

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Cooperating Organizations

Iowa Crop Improvement Association
Agriculture & Home Economics Experiment Station
Iowa State University Extension
Iowa Corn Promotion Board
U.S. Department of Agriculture

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Table 1A. 25 Top Yielding Hybrids Sorted by Moisture—District 4. 29,000 Planting Rate. LSD for 2003 Yield in Bushels is 9, for 2002 is 9 and for 2001 is 8. 2003 Protein Pct LSD = 0.2. 2003 Oil Pct LSD = 0.1. 2003 Starch Pct LSD = 0.4

		Year Book										Month Book										Road Lay Pct										Slack Lay Pct										Drop Ex Pct										Blank Pct										Precision Pct										Oil Pct										Stamps Pct										>Variance										Reason																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Breed	>Variety	Cross	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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Average of All Entries	175.8	180.9	181.4	16.9	18.0	16.8	7.6	0.3	1.6
Average of All Check Hybrids	175.3	191.2	182.3	16.3	18.0	17.0	6.7	0.7	1.6

SX = Single Cross, M3X = Modified Single Cross, 3X = 3-Way Cross, 4X = 4-Way Cross, S3X = Blend of Single Crosse
 e = Check Hybrid Entered by the User Group Improvement Association.
 1 = Short Check Hybrid Grown in Short Blocks.
 e = Hybrid Entered as a Short Hybrid and Grown in Short Blocks.
 * = One of the Top 25 Yielding Hybrids.

Table 1. Average Performance of Varieties Tested in District 4, 29,000 Planting Rate. LSD for 2003 Yield in Bushels is 9, for 2002 is 9, and for 2001 is 8. 2003 Protein Pct LSD = 0.2. 2003 Oil Pct LSD = 0.1. 2003 Starch Pct LSD = 0.4.

[illegible]

SX = Single Cross. MSX = Modified Single Cross. 3X = 3-Way Cross. 4X = 4-Way Cross. SXB = Blend of Single Crosses.
 \$ = Check Hybrid Entered by the Iowa Crop Improvement Association.
 † = Short Check Hybrid Grown in Short Blocks.
 ‡ = Hybrid Entered as a Short Hybrid and Grown in Short Blocks.
 > = One of the Top 25 Yielding Hybrids.

With the quick development of new hybrids today, it is becoming more difficult for growers to view several years of data on each hybrid to help them decide which hybrids to select for planting the following year. The next best thing is to look at hybrids' performances across several locations in one year. So, data from additional location groupings along with the standard district groupings are provided on the Iowa Crop Improvement Association's Web page at <http://www.agron.iastate.edu/cia/>. These additional tables, summarizing data across districts, make it possible to look at hybrids' performances averaged across more locations than in the past to help predict which hybrids may have the best relative performance potential under next year's growing conditions. These 18 new tables double or triple the number of locations reflected in each hybrid's performance data.

Table 2. Averages of 2002-03 (2-Year) and 2001-03 (3-Year) of Varieties Tested in District 4.
LSD for Yields Are 5 Bushels for 01-03 (3-Year) and 6 Bushels for 02-03 (2-Year).

3-Year Protein LSD = 0.1.
2-Year Protein LSD = 0.1.

3-Year Oil LSD = 0.1.
2-Year Oil LSD = 0.1.

3-Year Starch LSD = 0.2.
2-Year Starch LSD = 0.2.

Brand	Variety	Cross	Yield bu/a		Moisture Pct		Root Ldg Pct		Stalk Ldg Pct		Drop Ear Pct		Stand Pct		Protein Pct		Oil Pct		Starch Pct		Variety	Brand
			3 Year	2 Year	2 Year	3 Year	3 Year	2 Year	3 Year	2 Year	3 Year	2 Year	3 Year	2 Year	3 Year	2 Year	3 Year	2 Year	3 Year	2 Year		
Middlekoop	1207	SX	172	15.1			1		1		0		92		8.3		3.5		60.0		1207	Middlekoop
Kruger	9306YGC8	SX	182	15.2			1		0		0		95		8.1		3.7		60.1		9306YGC8	Kruger
KSC/Challenger	9310AYGC8	SX	191	16.1			0		1		0		90		7.7		3.8		60.4		9310AYGC8	KSC/Challenger
SOI	9102	SX	171	171	16.1	15.8	1	1	2	2	1	0	93	93	8.3	8.3	3.8	3.8	59.8	59.9	9102	SOI
Eplay	E24908t	SX	181	183	16.1	15.8	2	3	0	0	0	0	94	94	8.2	8.1	3.6	3.6	60.2	60.3	E24908t	Eplay
Cornelius	C590YG	SX	180	183	16.1	15.8	3	4	1	1	0	0	94	94	8.2	8.1	3.7	3.7	60.1	60.3	C590YG	Cornelius
DEKALB	DKC58-78(YG)	SX	183	16.1			3	0	0				94	94	8.3		3.6		60.1		DKC58-78(YG)	DEKALB
Renze	82618t	SX	185	16.2			4	0	0				93	93	8.0		3.6		60.4		82618t	Renze
Cornelius	C837YG	SX	188	16.6			0	0	0				93	93	7.7		3.6		60.5		C837YG	Cornelius
Cornelius	C635	SX	178	182	16.6	16.4	4	6	3	3	0	0	93	94	7.6	7.4	3.6	3.6	60.5	60.8	C635	Cornelius
Ottillie	49538t	SX	186	16.8			1	0	0				93	93	7.7		3.5		60.5		49538t	Ottillie
Rainbow	3125	SX	176	16.8			1	2	2				95		7.6		3.6		60.7		3125	Rainbow
Eplay	E3223	SX	182	16.8		16.6	3	5	2	2	1	0	92	93	7.7	7.4	3.7	3.5	60.4	60.7	E3223	Eplay
NK Brand	N65-M7	SX	179	16.8			6	3	0				92		7.4		3.6		60.7		N65-M7	NK Brand
Kaystar	KX-855	SX	181	17.1			7	2	2				91		7.4		3.6		60.9		KX-855	Kaystar
Wyffels	W7273	SX	185	17.1			4	1	0				95		7.8		3.9		60.0		W7273	Wyffels
Eplay	E3641	SX	180	17.2			3	2	0				92		7.4		3.1		61.5		E3641	Eplay
OEKALB	DKC60-19RRYG	SX	205	17.4			4	0	0				95		7.4		3.2		61.2		DKC60-19RRYG	OEKALB
SNK Brand	N67-T4	SX	180	183	17.6	17.5	3	4	1	1	0	0	95	96	7.7	7.5	3.7	3.6	60.8	60.8	N67-T4	SNK Brand
Ag Source	6183YGC8	SX	194	17.6			7	1	0				90		7.4		3.6		60.9		6183YGC8	Ag Source
\$Pioneer	34824	SX	184	17.7			4	1	0				94		8.0		3.4		60.6		34824	\$Pioneer
Kaystar	KX-8908t	SX	191	17.8			12	1	1				93		7.3		3.5		61.0		KX-8908t	Kaystar
\$Golden Harvest	H91648t	SX	183	186	18.2	18.3	1	2	1	1	0	0	90	89	7.8	7.6	3.8	3.7	60.3	60.5	H91648t	\$Golden Harvest
Jacobsen	J546458t	SX	184	185	18.3	18.3	6	8	1	1	0	0	92	91	7.9	7.7	3.7	3.6	60.4	60.7	J546458t	Jacobsen
Rainbow	3100YG	SX	187	18.3			4	0	0				90		7.7		3.5		60.7		3100YG	Rainbow
KSC/Challenger	9115	SX	188	18.4			6	2	2				91		7.3		3.4		61.2		9115	KSC/Challenger
Ottillie	52678t	SX	187	188	18.4	18.3	5	7	1	1	0	0	93	93	7.8	7.7	3.6	3.5	60.4	60.7	52678t	Ottillie
Eplay	E36308t	SX	186	188	18.4	18.3	3	4	1	1	0	0	93	94	7.8	7.7	3.6	3.5	60.6	60.8	E36308t	Eplay
Renze	83838t	SX	185	18.5			5	1	0				92		7.8		3.3		60.9		83838t	Renze
Ag Source	6203YGC8	SX	188	18.5			5	1	0				91		7.8		3.4		60.9		6203YGC8	Ag Source
Four Star	5758	SX	183	188	18.6	18.2	2	2	3	2	0	0	92	93	7.3	7.2	3.4	3.4	61.2	61.4	5758	Four Star
Four Star	57388t	SX	184	18.7			6	1	0				94		7.8		3.4		60.9		57388t	Four Star
Kruger	9315YGC8	SX	183	18.8			9	1	0				93		7.8		3.4		60.9		9315YGC8	Kruger
\$Pioneer	33851	SX	191	19.2			5	0	0				93		7.6		3.5		60.8		33851	\$Pioneer
Average of All Entries			180.9	185.8	17.3	17.2	2.9	4.3	1.4	1.0	0.2	0.1	92.6	92.7	7.8	7.7	3.7	3.5	60.4	60.7	Average of All Entries	
Average of Check Hybrids			181.7	188.7	18.2	17.9	2.0	3.8	0.8	0.6	0.1	0.0	92.3	92.9	7.7	7.7	3.7	3.5	60.4	60.7	Average of Check Hybrids	

SX = Single Cross. MSX = Modified Single Cross. 3X = 3-Way Cross. 4X = 4-Way Cross. SXB = Blend of Single Crosses.

\$ = Check Hybrid Entered by the Iowa Crop Improvement Association.

! = Short Check Hybrid Grown in Short Blocks.

= Hybrid Entered as a Short Hybrid and Grown in Short Blocks.